WHAT IS CLAIMED IS:

1. A valve assembly, comprising:

a housing having a valve chamber, a flow passageway extending through the valve chamber, and a piston chamber; and

a valve member in the housing and movable along a valve axis, the valve member including a plug portion arranged along the flow passageway for regulating fluid flow therethrough, the plug portion subjected to a first pressure urging the valve in a first direction;

a piston slidable in the piston chamber integral with the valve member, the piston having a first side subjected to the first pressure urging the valve in a second direction opposite said first direction and a second side subjected to a second pressure urging the valve in the first direction; and

a pressure passage providing fluid pressure communication between the first side of the piston and the valve plug portion.

2. The valve assembly of claim 1, wherein the pressure passage is defined at least in part internally through the valve member.

3. The valve assembly of claim 1, wherein the valve member includes a valve stem portion having a diameter that is smaller than a diameter of the plug portion, wherein a radially extending working face is formed between the stem portion and plug portion, and wherein the working face is subjected to said first pressure urging the valve in said second direction.

4. The valve assembly of claim 3, further comprising a vent passageway in fluidically connecting the piston chamber along said second side to the external atmosphere, whereby the second pressure is atmospheric pressure.

5. The valve assembly of claim 3, wherein the valve stem portion includes a larger diameter portion and a smaller diameter portion, the piston being integral with the valve member along the smaller diameter portion.

6. The valve assembly of claim 5, wherein the piston is formed separately of the valve member and includes a central hole receiving the valve stem portion therethrough, the piston being secured to the piston.

7. The valve assembly of claim 1, further comprising an electrical actuator acting upon valve member in axially spaced relation to the plug portion for reciprocating the valve member along the valve axis.

8. The valve assembly of claim 1, wherein the housing includes an annular valve seat coaxial about the valve axis and interposed on the flow passageway, the plug portion being movable toward and away from the seat between fully closed and open positions, and intermediate positions therebetween.

9. The valve assembly of claim 1, wherein the valve member is a fuel metering valve that meters fuel flowing along the flow passageway to a turbine engine.

10. The valve assembly of claim 1, wherein the pressure passage has a continuous open state for all operating positions of the valve member.

11. The valve assembly of claim 1, wherein said housing comprises a valve housing and a spring housing mounted to the valve housing, the spring housing including at least one spring biasing the valve in a predetermined direction.

12. The valve assembly of claim 11, wherein said housing includes an actuator housing comprising an electrical actuator mounted to the spring housing, the spring housing disposed between the electrical actuator and the valve housing.

13. The valve assembly of claim 1, wherein the valve member includes a valve stem, the valve stem including a radially extending working surface area subject to atmospheric pressure, and wherein the second pressure is atmospheric fluid pressure, and wherein the second side of the piston has a radially extending working surface area that is sized relative to the working surface area of the valve stem to reduce actuation force needed for moving the valve member.

14. The valve assembly of claim 13, wherein the radially extending working surface areas of the piston and the valve stem are about equal for substantially balancing fluid pressures axially across the valve member.

15. The valve assembly of claim 1, wherein the valve housing comprises a valve body, a valve cage mounted in the valve body, and a valve bonnet mounted to the valve body, the valve member slidably engaging the valve cage, and wherein the pressure passage extends through the valve member into an intermediate chamber defined between the valve member and the valve cage and through an axially extending passage formed in the valve cage to the piston chamber, the piston chamber being defined in the valve cage, wherein fluid pressure in the intermediate portion axially urges the valve member in said second direction.

16. A method of balancing fluid forces across a plug valve, comprising:

regulating a flow of fluid along a flow passageway with a valve member, the valve member including a plug portion that is adapted to restrict flow and a valve stem, the fluid acting upon the plug portion and being at a first pressure to provide a first force urging the valve member in a first direction;

actuating the valve stem to drive the valve member;

counteracting at least part of the first force with a second force generated by a piston integral with the valve member and slidable in a piston chamber, the piston having a first side subjected to the first pressure and a second side vented to ambient; and

communicating the first pressure from the flow passageway to the piston chamber on the first side.

17. The method of claim 16, wherein said actuating comprises electrically actuating with an electrical actuator driving the valve member.

18. The method of claim 16, wherein the first pressure applied to the first side urges the valve member in a second direction opposite said first direction.

19. The method of claim 16, further comprising metering fuel flow in a turbine engine along the flow passageway with the plug portion.

20. The method of claim 16, further comprising porting the first pressure to a radially extending working surface of the valve member, the first pressure acting upon the radially extending working surface separate from the piston to urge the valve member in a second direction opposite said first direction to further counteract said first force.

21. The method of claim 16, wherein said porting the first pressure is conducted at least in part through an internal passage in the valve member and at least in part through a housing slidably engaging the valve member.

22. A valve assembly, comprising:

a valve housing having a valve chamber, a flow passageway extending through the valve chamber, a piston chamber, and an annular valve seat surrounding the flow passageway;

a generally cylindrical valve member axially movable in the valve chamber toward and away the valve seat to close and open the flow passageway, the valve member including at least three different diameters to include a plug portion and a stepped stem portion, the plug portion including an end face engaging the valve seat when closed and subjected to a first pressure urging the valve in a first direction, wherein a radially extending first working face is defined between the plug portion and the stem portion, the first working face being subjected to the first pressure contained in an intermediate chamber between the stem portion and the valve housing, the intermediate chamber interposed axially between the piston chamber and the flow passageway;

a piston slidable in the piston chamber integral with the valve member, the piston having a first side subjected to the first pressure urging the valve in a second direction opposite said first direction and a second side subjected to a second pressure urging the valve in the first direction; and

a pressure passage having a continuous open state providing fluid communication between the piston chamber along first side of the piston, the intermediate chamber and the end face of plug portion for all operating positions of the valve member.

23. The valve assembly of claim 22, wherein the pressure passage is defined in part internally through the valve member, and in part through the valve housing.

24. The valve assembly of claim 22, further comprising:

first seal means sealing between the valve member and the valve housing for preventing passage of fluid between the intermediate chamber and the flow passageway;

second seal means between the valve member and the valve housing for preventing passage of fluid between the intermediate chamber and the piston chamber; and

third seal means between the piston and the valve housing for preventing passage of fluid therebetween; and

fourth seal means between the valve member and the valve housing for preventing leakage of fluid between the valve housing and the piston chamber.

25. The valve assembly of claim 22, further comprising an electrical actuator driving the valve stem, whereby the valve assembly is electrically actuated.